

Curriculum Vitae

Chae Woo Lim

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- Education** **Ph.D. Mechanical Engineering, Boston University**
Sept. 2024 - Present
P.I.: Dr. Sheila Russo, *Material Robotics Laboratory*
- M.S.E. Mechanical Engineering, University of Michigan**
Jan. 2023 – May 2024
GPA 4.0/4.0
- B.S.E. Mechanical Engineering, University of Michigan**
Sept. 2016 – Dec. 2022
GPA 3.7/4.0
Double minor in Computer Science and Space Sciences and Engineering
- Awards** **CISE PhD Student Scholar Award, Boston Univ.** 2024-2025
National Science Foundation Graduate Research Fellowship 2024 – 2028
William and Shirley Mirsky Memorial Fellowship, U. of Michigan 2023
James B. Angell Scholar, U. of Michigan 2022
- Research Experience** **Material Robotics Laboratory (MRL) Lab**
July 2024 – Present
P.I.: Prof. Sheila Russo
- Developing a soft robotic bronchoscope that can navigate to the peripheries of the lung and conduct tissue biopsy for cancer diagnosis
- Image Guided Medical Robotics (IGMR) Lab**
June 2023 – July 2024
P.I.: Prof. Mark Draelos
- Developed a movement prediction and compensation system for a Robotic Arm Optical Coherence Tomography (RAOCT) instrument to improve accessibility to eye disease diagnosis for patients with involuntary movement
 - Designed the optical, electrical, and mechanical systems for a robotic retinal imaging OCT system capable of motion correction *in vivo*
 - Improved the facial recognition accuracy and stability of the RAOCT system by implementing CNN-model-based facial recognition trained on synthetic face data

Evolution and Motion of Biology and Robotics (EMBiR) Lab

Sept. 2022 - July 2024

P.I.: Prof. Talia Moore

- Designed a new origami-inspired bistable soft actuator capable of high-strain, high-speed, and low-power actuation
- Designed and prototyped a SMA-driven robotic tail for study of animal tail locomotion
- Designed and prototyped a soft electrostatically actuated continuum robot for potential use in colonoscopy
- Explored and characterized the effect of geometric features on the bending performance of Hydraulically Amplified Self-healing Electrostatic (HASEL) actuators

Solar and Heliospheric Research Group

Sept. 2018 – Jul. 2019

P.I.: Prof. Justin Kasper

- Calibrated the Solar Probe Cup instrument that is currently on board the NASA Parker Solar Probe
- Developed a MATLAB program that identifies noise produced by the interaction between the High Voltage Power Supply and the spacecraft's proximity to the Sun

Wang Lab

Sept. 2016 – Feb. 2017

P.I.: Prof. Thomas Wang

- Designed and tested a temperature PID control system for an endomicroscope to improve in-vivo imaging resolution

Professional Experience

Intermode

May 2022 – Aug. 2022

Full Stack Mechanical Engineer Intern

- Designed, optimized, and analyzed the electromechanical steering system of a delivery robot platform named Modal, for increased durability and reliability
- Designed, prototyped, and manufactured a next generation 48V battery pack design, utilizing DFM/DFA strategies
- Utilized additive manufacturing methods to reduce cost and improve part turn-around time

Republic of Korea Air Force

Oct. 2019 – Aug. 2021

Maintenance Operations Center Technician / Interpreter / Airframe Mechanic / Staff Sergeant

- Coordinated and planned all maintenance operations of the ROKAF 17th Fighter Wing F-35A assets
- Interpreted technical communications between Group C.O., Q.C. Officers and L.M. and P&W FSEs
- Created a new TCTO search database using VBA Excel to flag incomplete action items on aircraft fleet

University of Michigan Solar Car Team

Sept. 2016 – Aug. 2018

Engineering Director, Crew Chief, Aerodynamicist, Driver

- Led the team in modifying the 14th generation solar car, placing 2nd in the 2018 American Solar Challenge
- Managed all 8 engineering divisions, outlining the vision, objectives and targets for each system in the 2018 cycle
- Designed and optimized the aerobody and components of the 14th gen. solar car using Siemens NX and Star CCM+
- Manufactured composite parts and chassis of the vehicle through resin infusion and pre-preg carbon fiber layups

Teaching

Graduate Student Instructor, University of Michigan

ENGR 100.580: Bioinspired Design 2023

- Developed new cross-disciplinary projects and lab lesson plans
- Led three lab sections for a total of 60 students
- Designed a low-cost linkage-based quadruped robot for use in studying scalability and energy consumption
- Guest lectured on Bio-inspired robotic controls

Publications Journals

M. Zhang, A. Pradhan, Z. Brei, X. Bu, X. Ye, S. Jamal, **C. W. Lim**, X. Huang, T. Y. Moore, “TALE-teller: Tendon-Actuated Linked Element Robotic Testbed for Investigating Tail Functions,” *IEEE Robotics and Automation Letters*, 2024 (Submitted)

Conference Papers

H. Pan*, **C. W. Lim***, K. King, R. Guan, M. Draelos, “Active Motion Cancellation for Robotic Optical Coherence Tomography of Moving Eyes,” in *2024 International Symposium on Medical Robotics (ISMR)*, Atlanta, GA, USA: IEEE.

Z. Brei* & **C. W. Lim*** & A. Ferguson*, A. Pradhan, V. V. Sangeetha, X. Bu, B. Usui, D. Johnson, R. Vasudevan, and T. Y. Moore, “HASEL Actuator Design for Out-of-Plane Bending: A Parametric Study of Planar Geometry,” in *2024 7th IEEE International Conference on Soft Robotics (RoboSoft)*, San Diego, CA, USA: IEEE.

Conference Abstract

H. Pan, **C. W. Lim**, C. Jin, M. McCloud, G. Zhou, and M. Draelos, “Towards mobile robotic optical coherence tomography for practical clinical imaging,” at *2025 SPIE Photonics West*, San Francisco, CA, USA, Jan. 28, 2025. (Accepted, *Future*)

C. W. Lim, H. Pan, K. King, R. Guan, M. Draelos, “Predictive scan aiming for optical coherence tomography imaging during simulated nystagmus.” Oral Presentation at *2024 ARVO*, Seattle, WA, USA, May 5, 2024.

C. W. Lim, Y. Kum, K. King, R. Guan, and M. Draelos, “Towards Robotic Optical Coherence Tomography of Moving Eyes,” Oral Presentation at *2024 SPIE Photonics West*, San Francisco, CA, USA, Jan. 29, 2024.

* indicates co-first authorship